

The following claims replace all previous versions of the claims.

1. (currently amended) A film, fiber or membrane comprising an intimate mixture of S-sulfonated keratin protein and a water soluble polymer, and a chemical cross-linking agent, the water soluble polymer selected from the group consisting of:

(a) poly (vinyl alcohol) (PVA) and

(b) poly (vinyl pyrrolidone) (PVP).

2. (canceled)

3. (previously presented) A film, fiber or membrane according to claim 1 wherein the S-sulfonated keratin protein is a S-sulfonated keratin protein fraction.

4. (previously presented) A film, fiber or membrane according to claim 3 in which the S-sulfonated keratin protein fraction is from the intermediate filament protein family.

5. (previously presented) A film, fiber or membrane according to claim 1 in which the S-sulfonated keratin protein is intact.

6. (canceled)

7. (previously presented) A method for making a material comprising:

(a) mixing a S-sulfonated keratin protein and a water soluble polymer to form an intimate mixture, the water soluble polymer selected from the group consisting of:

(a) poly (vinyl alcohol) PVA) and

(b) poly (vinyl pyrrolidone) (PVP).

(b) casting the intimate mixture so produced; and

(c) drying to create a material.

8. (currently amended) A method for making a material comprising:

(a) mixing a S-sulfonated keratin protein, a chemical cross-linker, and a water soluble polymer to form an intimate mixture, the water soluble polymer selected from the group consisting of:

(a) poly 9vinyl alcohol) PVA) and

(b) poly (vinyl pyrrolidone) (PVP); and

(b) extruding the intimate mixture produced from step (a) into a coagulation bath through a process of wet spinning.

9. (previously presented) A method for improving the physico-mechanical properties of the materials produced by claim 7, comprising introducing a cross-linker agent to form disulfide bonds and thus remove sulfonate functionalities.

10. (previously presented) A method according to claim 9 in which the cross-linking agent used as a reductant is a thiol or thioglycollate salt.

11. (previously presented) The method according to claim 9 in which the physico-mechanical properties are wet and dry strength.

12. (original) A method according to claim 10 in which the thioglycollate salt is ammonium thioglycollate.

13. (canceled)

14. (previously presented) The method according to claim 7 or 8 wherein the S-sulfonated keratin protein is a S-sulfonated protein fraction.

15. (previously presented) The method according to claim 14 wherein the S-sulfonated keratin protein fraction is from the intermediate filament protein family.

16. (previously presented) The method according to claim 7 or 8, wherein the S-sulfonated keratin protein is intact.

17. (currently amended) A method of improving the wet strength properties of the materials produced by the method of claim 7 ~~or~~ 8, comprising incorporating a cross-linking agent into them.

18. (original) A method according to claim 17 in which the cross-linking agent is a protein in the intimate mixture.

19. (original) A method according to claim 17 in which the cross-linking agent is selected from the group consisting of formaldehyde and glutaraldehyde.

20. (previously presented) A process for improving the mechanical properties of a material produced by a method of claim 7 or 8, comprising heat treating the composite matrix to enhance its crystalline properties.

21-25. (canceled)

26. (currently amended) An S-sulfonated keratin protein derivative material ~~according to claim 21, wherein~~ in which the keratin protein derivative is chemically bonded to a the monomer or polymer material is selected from the acrylate, epoxide or anhydride group.

27-28. (canceled)

29. (new) The film, fiber or membrane of claim 1 or 8, further comprising a plasticizer.

30. (new) The film, fiber or membrane of claim 29, wherein the plasticizer is glycerol or polyethylene glycol

31. (new) The film, fiber or membrane of claim 1 or 8, wherein the cross-linking agent is formaldehyde, glutaraldehyde, 1-ethyl-3-(dimethylaminopropyl)carbodiimide, dimethylsuberimidate, or N,N'-methylenebisacrylamide.